REMARKS

Favorable reconsideration is respectfully requested in view of the following remarks.

I. Claim Status

Claims 1, 2, and 4-14 are pending and stand rejected.

Applicants note that the present response does not contain any claim amendments. Nor does it present any new issues requiring further consideration and/or search. Accordingly, if the next Official Action on the merits includes a new ground of rejection of one or more claims, the Action must be non-final.

Applicants thank the Examiner for the careful examination of this case and respectfully request reconsideration of the case. Below Applicants address the rejections in the Official Action and explain why the rejections are not applicable to the pending claims as amended.

II. Obviousness Rejections

Claims 1-2, 4-9, and 11-14 were rejected under 35 U.S.C. § 103(a) as being obvious over KAIS (US 6,177,205) in view of BHADESHIA (US 5,879,474) for the reasons in item 2 on pages 2-3 of the Official Action. Claim 10 was rejected under 35 U.S.C. § 103(a) as being obvious over KAIS and BHADESHIA and the prior art described in the last six lines of page 3 of the instant

application for the reasons in item 3 on pages 3-4 of the Official Action. These rejections are respectfully traversed.

The rejections should fall, because the cited prior art references fail to teach, suggest or make obvious all of the limitations of independent claims 1 and 12 (which are the sole independent claims), as required to support a *prima facie* case of obviousness.

Claim 1 recites: "A stretch of rail comprising a railway switch element made from high-alloy steel, in which at least one alloy element has a content equal to at least 5% by weight, and a length of rail made from medium-alloy steel, directly connected to one another by a weld without deposition of metal, wherein the length of rail is formed from a medium-alloy low-carbon steel in which the carbon content is less than 0.55% by weight and which is a bainitic steel." Accordingly, claim 1 has to be understood as follows:

- it is related to a stretch of rail, the stretch of rail comprising a railway switch element and at least one length or rail (generally the stretch of rail comprises two or four lengths of rail);

- the stretch of rail being made from <u>high-alloy steel</u> in which at least one alloy element has a content equal to at least 5% by weight;

- each length of rail being made from a <u>medium-alloy low-carbon steel</u>, the <u>carbon content of the</u>

steel being less than 0.55% by weight (i.e., chemical composition), the steel being a bainitic steel, i.e., the steel having a micrographic structure being essentially or totally bainitic; and

- each length or rail being directly connected to the railway switch element by welding without deposition of metal.

It is believed that the cited references of KAIS (US 6,177,205) and BHADESHIA (US 5,879,474) fail to disclose or suggest these features.

Again, claims 1 and 12 require the length of rail being made from a medium-alloy low-carbon steel, the carbon content of which is less than 0.55% by weight (i.e., chemical composition), and more importantly, "which is a bainitic steel". In other words, this means that the steel in the length of rail of the claim 1 has a micrographic structure being essentially or totally bainitic.

By contrast, KAIS (US 6,177,205) discloses a railroad track composed of: (i) a carbon steel, which is a mixed micrographic structure comprising 30-40% bainite and at least 50% pearlite, and (ii) a high-manganese steel, the latter being joined to the carbon steel by electron-beam welding or indirectly by an intermediate layer comprising a nickel-based alloy. See, col. 1, lines 55-60 and col. 4, lines 22-23 of KAIS (US 6,177,205). The Official Action does not appear to have not taken

this important distinction into consideration. Again, the carbon steel in KAIS (US 6,177,205) has a structure of at least 50% pearlite.

This mixed steel in KAIS (US 6,177,205) is not the same, nor is it suggestive of, the steel in the length of rail of claim 1, which has a micrographic structure being essentially or totally bainitic as required by the language ("and which is a bainitic steel") of claim 1. See also, claim 12, which recites: "wherein the length of rail made of medium-alloy steel consists essentially of a medium-alloy low-carbon steel in which the carbon content is less than 0.55% by weight and said medium-alloy low-carbon steel is bainitic." Indeed, it is believed that such claim language excludes the carbon steel in KAIS (US 6,177,205) having a mixed structure of at least 50% pearlite.

Furthermore, it should be noted that the rails made of steel having a mixed structure comprising 30-40% bainitic and more than 50% pearlite of KAIS (US 6,177,205) cannot have the same properties (mechanical and so on) of the claimed rails of the instant application, in which the medium-alloy low-carbon steel is only a bainitic steel. This is evident from the well understood principles that the micrographic structure and properties of steel result from heat treatments (during manufacturing process) and they depend on the chemical composition and the heat treatment (or more generally, the heat history of the steel). The micrographic structure can be ferrite,

pearlite, bainite, martensite or austerite, or a combination of two or more of these structures. The properties of the steel depend from the structure, from the chemical composition, and from heat treatment. The structure can be recognized by micrographic examination under microscope. This is very well known in the art.

Thus, as the structure of the steel rails in claim 1 is bainitic, these rails are different from the rails of KAIS (US 6,177,205), which are made of a steel whose microstructure (or micrographic structure) comprises at least 50% pearlite. As the microstructures are different, so the properties are different.

Further, the claim feature of "medium alloy low-carbon steel" means a steel containing alloying element, the contents of each alloying element being less than 5%.

As pearlite is a micrographic structure, pearlite is not an alloying element. Therefore, a steel whose structure comprises more than 50% of pearlite, as in KAIS (US 6,177,205), is not a high alloy steel. In the same manner, "baintic" steel does not means that it is a medium alloy steel.

Thus, it is believed that the rails made of steel having a mixed structure comprising 30-40% bainitic and more than 50% pearlite in the rails of KAIS (US 6,177,205) are not the same as, nor are they suggestive of, the claimed rails of the instant application, in which the medium-alloy low-carbon steel is only a bainitic steel. Nor do the mixed steel structures in KAIS (US

6,177,205) have the same properties (mechanical and so on) of the claimed steel.

These important features distinguish claims 1 and 12 over the cited prior art teachings.

Further, it is believed that the mixed rails made of steel having a mixed structure comprising 30-40% bainitic and more than 50% pearlite of KAIS (US 6,177,205) teach away from the claims in which the steel in the length of rail has a micrographic structure being essentially or totally bainitic. In this regard, the combination of KAIS (US 6,177,205) and BHADESHIA (US 5,879,474) would lead away from the claimed invention, as it would lead to a different rail having a combination of bainite and pealite. It is well established that the prior art must be considered in its entirety including sections that teach away from the invention. Moreover, a prior art reference that "teaches away" from the claimed invention is a significant factor to be considered in determining obviousness. M.P.E.P., Eighth Ed., Rev. 6 (September 2007) at § 2145, X, D, 1. Thus, it is believed that KAIS (US 6,177,205) and BHADESHIA (US 5,879,474) cannot be combined and/or modified to arrive at the claimed invention.

Further, the requirement in claim 1 that each length or rail “being directly connected to one another by a weld without deposition of metal” is significant, because it means that it is connected without an insert between the railway switch element and the length of rail. For the skilled artisan, “welding without

deposition of metal" means welded by a process using no filler metal as is the case for flash welding or electron beam welding. However, KAIS (US 6,177,205) does not disclose this.

Instead, regarding claim 8, KAIS (US 6,177,205) discloses joining the manganese steel part to the carbon steel by electron-beam welding or by flash welding using a nickel-based allow insert (see claim 1). By contrast, in the present invention, there is no flash welding using a nickel-based allow insert. See, for instance, claim 8. As to the method of welding in the form of flash welding and forging recited in claim 8, Applicants do not agree with the position in the Official Action. In fact, it is technically easy to distinguish the method of welding that was used, by metallographic examination of the welding.

Moreover, it is not true to say, as in the Official Action, that "it would have been obvious to one skilled in the art to use either form of welding for forming the track of KAIS (US 6,177,205) so as to achieve the expected benefit of the selected form of welding". KAIS (US 6,177,205) makes a clear difference between electron beam welding which is used to directly join carbon steel and manganese steel and the other welding methods which are used when using an intermediate layer of nickel-based alloy. See, for example, column 2, lines 5-10, column 3, line 44 to column 4, line 14.

Further, given the above-noted differences in chemical composition and properties and in welding, it is not true to say that it would be obvious to combine KAIS (US 6,177,205) with BHADESHIA (US 5,879,474) as such a combination would result in safety problems that arise with the welding of two parts of a stretch of rail. The quality of the stretch of rail is very important because if the rail breaks it could lead to train derailing. Given such safety concerns, it would not have been obvious to one of ordinary skill in the art to replace the carbon steel of BHADESHIA (US 5,879,474).

Further, KAIS (US 6,177,205) discloses a heat treatment step to arrive at a rail of steel having a combination of bainite and pealite. By contrast, in the present invention, there is no heat treatment after welding. Such a heat treatment as in KAIS (US 6,177,205) imparts a further structural change on the properties of the stretch of rail that is different from the claimed rail. Please see claim 9, which recites there is no heat treatment after welding. Though the instant claims are product claims, whereas the above-noted feature of heat treatment relates to a process, this process limitation should be given patentable weight since the step of heat treatment imparts a structural change on the properties of the claimed stretch of rail.

In view of the above, Applicants believe that neither KAIS (US 6,177,205), nor BHADESHIA (US 5,879,474), nor the prior art described in the last six lines of page 3 of the instant

application, taken alone or in combination, teaches, suggests or makes obvious each and every element of the claims. Thus, independent claims 1 and 12 are believed to be novel and non-obvious over the combination of KAIS and BHADESHIA and the prior art described in the last six lines of page 3 of the instant application.

Therefore, Applicants respectfully submit that the above-noted 103(a) obviousness rejections are untenable and should be withdrawn.

III. Conclusion

Having addressed all of the issues in the Official Action, it is respectfully submitted that the application is in condition for allowance and notice thereof is requested. If the Examiner has any comments or proposals for expediting prosecution, please contact the undersigned attorney at the telephone number below.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

YOUNG & THOMPSON

/Jay F. Williams/

Jay F. Williams, Reg. No. 48,036
209 Madison Street, Suite 500
Alexandria, VA 22314
Telephone (703) 521-2297
Telefax (703) 685-0573
(703) 979-4709

JFW/ml/jr